

CLAIMS

What is Claimed is:

1. A composition comprising a homogeneous melt blend of a poly(vinyl alcohol) and a poly(ethylene oxide), the blend having improved melt processability and mechanical properties without the addition of plasticizers.

2. The composition of Claim 1, wherein the poly(ethylene oxide) comprises a grafted poly(ethylene oxide).

3. The composition of Claim 1, wherein the poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and at least one vinyl monomer.

4. The composition of Claim 1, wherein the poly(ethylene oxide) comprises a graft copolymer of a homopolymer of poly(ethylene oxide) and at least one polar vinyl monomer.

5. The composition of Claim 4, wherein the at least one polar vinyl monomer is selected from the group of 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylates, poly(ethylene glycol) ethyl ether methacrylates, poly(ethylene glycol) acrylates, poly(ethylene glycol) ethyl ether acrylate, poly(ethylene glycol) methacrylates with terminal hydroxyl groups, acrylic acid, maleic anhydride,

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itaconic acid, sodium acrylate, 3-hydroxypropyl methacrylate, acrylamide, glycidyl methacrylate, 2-bromoethyl acrylate, carboxyethyl acrylate, methacrylic acid, 2-chloroacrylonitrile, 4-chlorophenyl acrylate, 2-cyanoethyl acrylate, glycidyl acrylate, 4-nitrophenyl acrylate, pentabromophenyl acrylate, poly(propylene glycol) methacrylate, poly(propylene glycol) acrylate, 2-propene-1-sulfonic acid and its sodium salt, sulfoethyl methacrylate, 3-sulfopropyl methacrylate, and 3-sulfopropyl acrylate.

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6. The composition of Claim 1, wherein the poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and from about 1 to about 30 weight percent of a polar vinyl monomer, a polar vinyl oligomer, a polar vinyl polymer or a combination thereof.

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7. The composition of Claim 1, wherein the poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylate or derivatives or analogs of poly(ethylene glycol) methacrylate.

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8. The composition of Claim 1, wherein the poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and 2-hydroxyethyl methacrylate.

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9. The composition of Claim 1, wherein the poly(ethylene oxide) is a thermoplastic, water-soluble poly(ethylene oxide), the poly(vinyl alcohol) is a thermoplastic, water-soluble poly(vinyl alcohol) and the composition is thermoplastic and water-soluble without the addition of plasticizers. ¹²

10. The composition of Claim 1, wherein the melt blend comprises from about 1 weight percent to about 99 weight percent of poly(ethylene oxide) and from about 1 weight percent to about 99 weight percent of poly(vinyl alcohol).

11. The composition of Claim 1, wherein the melt blend comprises from about 10 weight percent to about 90 weight percent of poly(ethylene oxide) and from about 10 weight percent to about 90 weight percent of poly(vinyl alcohol).

12. The composition of Claim 1, wherein the melt blend comprises from about 10 weight percent to about 50 weight percent of poly(ethylene oxide) and from about 50 weight percent to about 90 weight percent of poly(vinyl alcohol) compatible blend.

13. A thermoplastic, water-soluble composition comprising a compatible melt blend of poly(vinyl alcohol) and grafted poly(ethylene oxide).

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14. The composition of Claim 13, wherein the grafted poly(ethylene oxide) is a graft copolymer of poly(ethylene oxide) and at least one vinyl monomer.

15. The composition of Claim 13, wherein the grafted poly(ethylene oxide) is a graft copolymer of a homopolymer of poly(ethylene oxide) and at least one polar vinyl monomer.

16. The composition of Claim 13, wherein the grafted poly(ethylene oxide) is a graft copolymer of poly(ethylene oxide) and at least one polar vinyl monomer selected from 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylates, poly(ethylene glycol) ethyl ether methacrylates, poly(ethylene glycol) acrylates, poly(ethylene glycol) ethyl ether acrylate, poly(ethylene glycol) methacrylates with terminal hydroxyl groups, acrylic acid, maleic anhydride, itaconic acid, sodium acrylate, 3-hydroxypropyl methacrylate, acrylamide, glycidyl methacrylate, 2-bromoethyl acrylate, carboxyethyl acrylate, methacrylic acid, 2-chloroacrylonitrile, 4-chlorophenyl acrylate, 2-cyanoethyl acrylate, glycidyl acrylate, 4-nitrophenyl acrylate, pentabromophenyl acrylate, poly(propylene glycol) methacrylate, poly(propylene glycol) acrylate, 2-propene-1-sulfonic acid and its sodium salt, sulfo ethyl methacrylate, 3-sulfopropyl methacrylate, and 3-sulfopropyl acrylate.

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17. The composition of Claim 13, wherein the poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and from about 1 to about 30 weight percent of a polar vinyl monomer, a polar vinyl oligomer, a polar vinyl polymer or a combination thereof.

18. The composition of Claim 13, wherein the grafted poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and a monomer selected from 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylate and derivatives and analogs of poly(ethylene glycol) methacrylate.

19. The composition of Claim 13, wherein the poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and 2-hydroxyethyl methacrylate.

20. The composition of Claim 13, wherein the grafted poly(ethylene oxide) is a thermoplastic, water-soluble grafted poly(ethylene oxide), and the poly(vinyl alcohol) is a thermoplastic, water-soluble poly(vinyl alcohol).

21. The composition of Claim 13, wherein the melt blend comprises from about 1 weight percent to about 99 weight percent of grafted poly(ethylene oxide) and from about 1 weight percent to about 99 weight percent of poly(vinyl alcohol).

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5 22. The composition of Claim 13, wherein the melt blend comprises from about 10 weight percent to about 90 weight percent of grafted poly(ethylene oxide) and from about 10 weight percent to about 90 weight percent of poly(vinyl alcohol).

10 23. The composition of Claim 13, wherein the composition comprises from about 10 weight percent to about 50 weight percent of grafted poly(ethylene oxide) and from about 50 weight percent to about 90 weight percent of poly(vinyl alcohol).

15 24. A thermoplastic, water-soluble composition consisting essentially of a melt blend of a poly(vinyl alcohol) and a grafted poly(ethylene oxide).

20 25. The composition of Claim 24, wherein the grafted poly(ethylene oxide) is a grafted copolymer of poly(ethylene oxide) and at least one polar, vinyl monomer.

25 26. The composition of Claim 24, wherein the grafted poly(ethylene oxide) comprises a graft copolymer of poly(ethylene oxide) and a monomer selected from 2-hydroxyethyl methacrylate, poly(ethylene glycol) methacrylate and derivatives and analogs of poly(ethylene glycol) methacrylate.

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31. The article of Claim 30, wherein the personal care article is a diaper.

32. The article of Claim 30, wherein the personal care article is a pantiliner.

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